State Route-248
SR-224 in Park City
to SR-32 in Kamas
Level One Corridor Study

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UDOT
Planning Section

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Executive Summary

Corridor studies are the map for the Utah Department of Transportation (UDOT) and local governments to identify, evaluate, and set priorities for the statewide transportation system. They provide information to develop regional and statewide long-range transportation plans which, in turn, provide projects to short-range transportation improvement programs.

The State Route-248 (SR-248) Corridor Study begins at milepost 0.0 at the intersection of SR-224 in Park City and ends at the intersection of SR-32 at approximately milepost 14.5 in Kamas. Because of the length of the corridor and the variability of traffic volume and development, it has been divided into three segments. The segments are based upon historic traffic characteristics and the intensity of commercial and residential development.

The main concerns with SR-248 are peak hour congestion and pedestrian concerns in Segments 1 and 2 and peak hour congestion and bicycle lanes for Segment 2. With three schools located very close to each other in Segment 1, Park City has concerns about vehicle and pedestrian access to the schools. This access affects traffic because of the limited travel lanes. While Segment 1 has been striped for bicycle lanes, there is a desire by Park City to have bicycle lanes on SR-248 to US-40.

UDOT has planned to widen SR-248 to four-lanes from SR-224 (four-lanes) through Segment 2 to the Wasatch County line. UDOT plans to widen this 8.22 mile section before the year 2025. Traffic analysis has shown that future travel demand will exceed capacity in this area in 2027 for a two-lane road.

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1 IDENTIFICATION OF TRANSPORTATION CORRIDOR STUDY AREA

The Utah Department of Transportation's (UDOT) objective of corridor studies is to develop a best-practice management strategy of the overall statewide transportation system through data collection and analysis of the individual corridors of which it is comprised. Corridor studies investigate conditions of a route and develop possible transportation solutions. They provide an opportunity for UDOT and local government(s) to discuss the corridor and how the corridor does or does not serve their interests or plans. This process may identify strategies in which the corridor can best serve both state and local government interests. Corridor plans are developed from the studies and identify which possible improvements may be needed to improve Utah's transportation system into the future. Corridor plans are the map for UDOT to identify, evaluate, and set priorities for the corridor transportation system. They provide information to develop regional and statewide long-range transportation plans for the 20 plus year horizon which, in turn, provide projects to short-range transportation improvement programs for a six year planning horizon.

Corridor planning is UDOT's program for managing its transportation systems, i.e. the state-administered portion of the overall network, for the long-range plan horizon, and for establishing a vision of corridor needs beyond that. Each corridor study area includes the transportation corridor – the geographic area that influences its performance – in addition to the transportation systems and facilities that make up the corridor.

UDOT has developed, and is continuing to refine, a statewide highway project prioritization system. A number of factors and issues contribute to a project's priority including those related to safety criteria, capacity, pavement management, and bridge sufficiency. This system is used to determine which projects should receive priority status and to assist in establishing a system-wide needs list and long-range plan. Individual corridor plans are one of UDOT's main methods to define corridor and system needs. The proposed projects identified by corridor studies may be primarily focused on preservation, safety, system management, or mobility.

1.1 Corridor Description

The SR-248 Corridor Study begins at milepost 0.0 at the intersection of SR-224 in Park City, Utah and extends eastwards to milepost 14.5 at the intersection of SR-32 in Kamas. Due to the length of the corridor and the variability of traffic volume and development, the corridor has been divided into three segments. The segments are based upon historic traffic characteristics and the intensity of commercial and residential development.

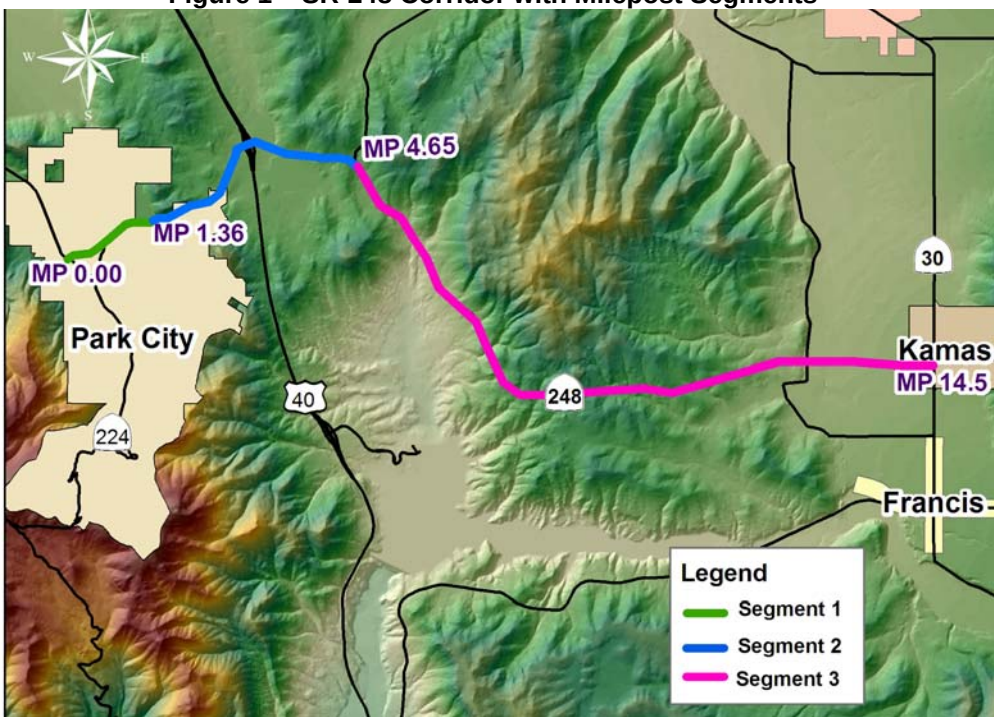
- Segment 1 begins at milepost 0.0 and ends at milepost 1.36 at the intersection of Wyatt Earp Way. The volume of traffic and amount of development (commercial and residential) in this segment have historically been higher than in the other two segments.

- Segment 2 begins at milepost 1.36 and ends at milepost 4.65 at the intersection of Brown's Canyon Road. In the past, this segment experienced lower traffic volume and development than Segment 1 but higher values in these areas than Segment 3.

- Segment 3 begins at milepost 4.65 and ends at milepost 14.5 at the intersection of SR-32. Development was limited in this segment, as reflected by historically low traffic volumes.

Figure 1 shows a map of the SR-248 corridor with the three defined milepost segments.

Figure 1 – SR-248 Corridor with Milepost Segments



SR-248 is primarily a two lane facility. All portions have shoulders and a center turn lane. There are six traffic signals in the 36.46 miles of roadway, and the posted speed limit is 35 mph in Segments1 and 45 to 60 mph in Segments 2 and 3.

1.2 Environmental, Cultural, and Historical Locations within the Corridor

Park City became famous as a silver mining town and boasts a lively and colorful past. Founded by prospectors in the late 1860's, Park City continued to mine silver until the early 1970's. The mining company, Park City Consolidated Mines, started the ski business in 1963 when they built the first lifts on what was then called Treasure Mountain. The Park City area now has three world class resorts and was a primary venue for the 2002 Winter Olympic Games.

Figure 2 – Silver King Coalition Mines Co

Source: Park City Historical Society and Museum

Kamas was settled in 1859 and incorporated in 1912. Kamas was known for its lumber and agricultural industries. Plentiful trees in the nearby mountains, an abundance of water for livestock and crops, and fertile soil for the growing of crops, provided the basis for life in this settlement. Today, only about one percent is engaged in lumber or agricultural employment. The average commute to work is 24 minutes.

1.3 Historical Perspective of the Corridor

SR-248 was primarily constructed to provide access to and connection between Park City and Kamas. Silver mining was Park City's primary industry until silver prices fell and outdoor recreation replaced mining. Kamas provided important agricultural products such as grain, dairy products, and livestock; and provided lumber products to Park City and the surrounding area. SR-248 was needed to transport these products to Park City and the Salt Lake Valley. Today, SR-248 still serves as the main access and link between Park City and Kamas.

1.4 Population, Employment, and Demographics

Park City and Kamas are the only incorporated areas of concern within the study corridor. According to the state population projections shown in Table 1, population in Park City and Kamas is expected to continue growing in the future; indicating that traffic volume on SR-248 will also increase.

Table 1 – Population

Year	Park City	10 year increase	Kamas	10 year increase
2000	7,371		1,274	
2010	10,987	49%	1,860	46%
2020	15,339	40%	2,738	47%
2030	19,776	29%	3,529	29%

Source: Governor's Office of Planning and Budget, February, 2007

Employment along SR-248 comes from resorts and lodges located within the corridor as shown in Table 2. Due to the nature of the outdoor recreation industry, most of these employment opportunities are seasonal.

Table 2 – Employment

Employer	Estimated Number of Employees
Deer Valley Resort	500 - 1000
The Canyons Resort	500 - 1000
Park City School District	500 - 1000
Park City Mountain Resort	250 - 500
Park City Municipal Corporation	250 - 500
Stein Eriksen Lodge	250 - 500
Premier Resorts of Utah, Inc.	250 - 500
Summit County	250 - 500

2 ANALYSIS OF EXISTING CONDITIONS

The existing conditions analysis summarizes the existing land use patterns, traffic patterns/characteristics, environment, utilities, right-of-way, safety, geometric design, structures, maintenance, pavement condition, alternative modes and efficient intermodal transfer, access management strategies, and other relevant studies.

2.1 Analysis Area

The analysis area begins at milepost 0.0 at the intersection of SR-224 in Park City and terminates at the intersection of SR-32 in Kamas.

2.1.A Land Use Patterns

Segment 1 is characterized by a great deal of commercial and residential development. There are also numerous recreational areas and a few schools in this segment. Land use in Segment 2 is primarily residential with a few commercial establishments and some vacant lands. Most of the land within Segment 3 is vacant; however, there are some low intensity commercial and residential developments and agricultural activity towards the end of the segment in Kamas.

Table 3 – Land Use Characteristics

Segment	Commercial	Residential	Schools	Recreation	Agricultural
1	High	High	Yes	No	No
2	Low	Low	No	Yes	No
3	Low	Low	No	Yes	Yes

2.1.B Traffic Patterns/Characteristics

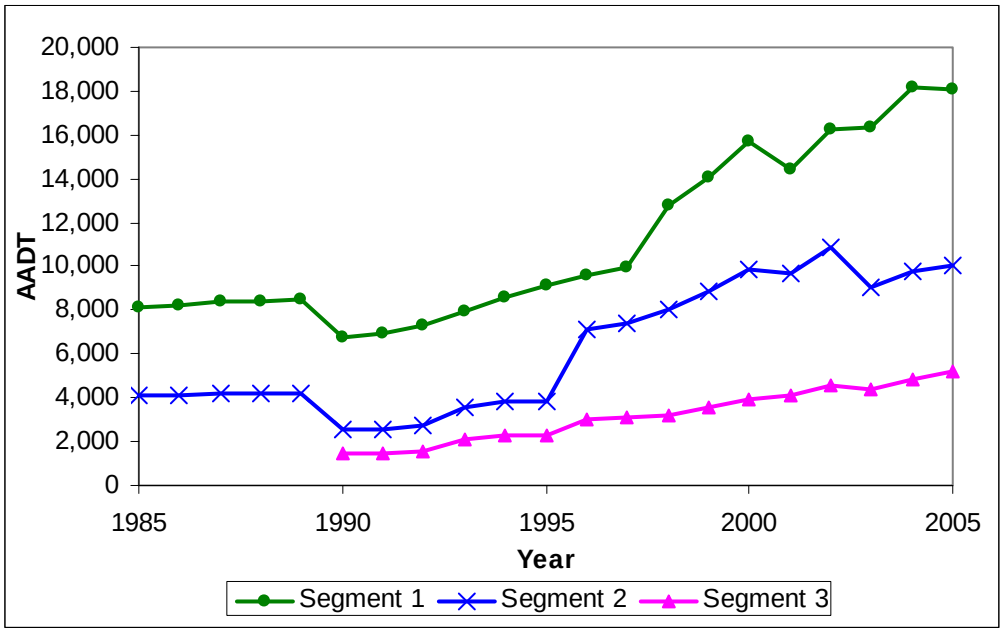
The major traffic generators along this corridor are schools and residential developments. The few commercial developments within SR-248 also generate some traffic.

Traffic varied from 1985 to 2005 along SR-248 as shown in Figure 3. For example, Segment 1 experienced a 20 percent drop in 1989 and an eight percent drop in 2000 during construction on the route. To compute historic growth rates, it was assumed that traffic growth on this corridor was linear from 1985 to 2005. Segment 1 traffic volume was the highest compared to the other segments. Generally, traffic growth in this segment was ten percent from 1985 to 2005 for an average of 570 additional AADT per year. Segment 1 does experience congestion near the schools because of vehicle and pedestrian traffic.

Historic traffic trends show that traffic volume in Segment 2 was lower than in Segment 1 but higher than in Segment 3. The amount of traffic in Segment 2 grew at a rate of 20 percent per

year (411 AADT per year based on 1985 volume) from 1985 to 2005. Segment 3 experienced the lowest traffic volume compared to the other two segments. Traffic counts in this segment are not available prior to 1990. Traffic growth in Segment 3 from 1990 to 2005 was 16 percent or 260 AADT per year based on 1990 volume.

Figure 3 – Historic Traffic Trends



Source: Traffic on Utah Highways

2.1.C Environment

The following contains screening level information regarding various environmental topics.

Economic

The economy in Summit and Wasatch counties – where SR-248 is located – is primarily tourism based. A large number of resorts and clubs are situated and being constructed along the corridor. According to UDOT's Truck Traffic on Utah Highways 2005 report, truck traffic varied from 15 percent near the intersection of SR-224 in Park City to 39 percent near the intersection of SR-32. Much of this truck traffic is for construction of second homes, resorts, and new development.

Air Quality

Summit and Wasatch Counties are not listed as non-attainment or maintenance areas for air quality.

Noise

There are many residential and commercial developments close to the corridor in Park City. If widening occurs, noise may become a concern.

Water Quality

Due to the extensive mining from the mid 1800s through the 1970s, water quality is a concern in these areas. Mining took place throughout Park City and, in particular, at the Silver King Mine which is located at the headwaters of Silver Creek. Surface and ground water may contain metals such as zinc, silver, cadmium, copper, lead, and mercury.

Wetlands

According to the National Wetlands Inventory (NWI) maps, there are many locations that have been identified as wetlands along SR-248 in Segments 2 and 3, especially in the Kamas Valley. Much of these wetlands are being used as farmland or pasture for the grazing of animals.

Wildlife

The only identified critical habitat along the SR-248 corridor is approximately seven miles of moose habitat in Segments 2 and 3 from approximately mile post four to mile post ten.

Threatened or Endangered Species

The following three tables contain Summit and Wasatch County animal and plant species that are or have been listed as one or more of the following: Federally-listed or candidate species under the Endangered Species Act (S-ESA), Wildlife species of concern (SPC), and Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing (CS). The animals and plants listed below are found in Summit or Wasatch Counties but may not be specific to the corridor of SR-248.

Table 4 – Animal Species in Summit County of S-ESA, SPC, or CS Status

Common Name	Scientific Name	State Status
Bald Eagle	Haliaeetus Leeucocephalus	S-ESA
Bluehead Sucker	Catostomus Discobolus	CS
Bobolink	Dolichonyx Oryzivorus	SPC
Bonneville Cutthroat Trout	Oncorhynchus Clarkii Utah	CS
Brown (Grizzly) Bear	Ursus Arctos	S-ESA
Canada Lynx	Lynx Canadensis	S-ESA
Colorado River Cutthroat Trout	Oncorhynchus ClarkII Pleuriticus	CS
Columbia Spotted Frog	Rana Luteiventris	CS
Deseret Mountainsnail	Oreohelix Peripherica	SPC
Greater Sage-Grouse	Centrocercus Urophasianus	SPC
Leatherside Chub	Gila Copei	SPC
Lewis' Woodpecker	Melanerpes Lewis	SPC
Long-Billed Curlew	Numenius Americanus	SPC
Northern Goshawk	Accipiter Gentilis	CS
Smooth Greensnake	Opheodrys Vernalis	SPC
Three-Toed Woodpecker	Picoides Tridactylus	SPC
Western Pearlshell	Margaritifera Falcata	SPC
Western Toad	Bufo Boreas	SPC

S-ESA (Federally-listed or candidate species under the Endangered Species Act)
SPC (Wildlife species of concern)

CS (Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing)

Source: State of Utah, Natural Resource, Division of Wildlife Resources, Sensitive Species by County, 2006.

(There are no plant species listed in Summit County.)

Table 5 – Animal Species in Wasatch County of S-ESA, SPC, or CS Status

Common Name	Scientific Name	State Status
Bald Eagle	Haliaeetus Leeucocephalus	S-ESA
Black Swift	Cypseloides Niger	SPC
Bluehead Sucker	Catostomus Discobolus	CS
Bobolink	Dolichonyx Oryzivorus	SPC
Bonneville Cutthroat Trout	Oncorhynchus Clarkii Utah	CS
Brown (Grizzly) Bear	Ursus Arctos	S-ESA
Canada Lynx	Lynx Canadensis	S-ESA
Colorado River Cutthroat Trout	Oncorhynchus ClarkII Pleuriticus	CS
Columbia Spotted Frog	Rana Luteiventris	CS
Ferruginous Hawk	Buteo Regalis	SPC
Fringed Myotis	Myotis Thysanodes	SPC
Greater Sage-Grouse	Centrocercus Urophasianus	SPC
Leatherside Chub	Gila Copei	SPC
Lewis' Woodpecker	Melanerpes Lewis	SPC
Long-Billed Curlew	Numenius Americanus	SPC
Northern Goshawk	Accipiter Gentilis	CS
Roundtail Chub	Gila Robusta	CS
Short-Eared Owl	Asio Flammeus	SPC
Smooth Greensnake	Opheodrys Vernalis	SPC
Three-toed Woodpecker	Picoides Tridactylus	SPC
Townsend's Big-Eared Bat	Corynorhinus TownsendII	SPC
Western Toad	Bufo Boreas	SPC
Whooping Crane	Grus Americana	S-ESA
Yellow-Billed Cuckoo	Coccyzus Americanus	S-ESA

Source: State of Utah, Natural Resource, Division of Wildlife Resources, Sensitive Species by County, 2006.

Table 6 – Plants in Wasatch County of S-ESA, SPC, or CS Status

Common Name	Scientific Name	State Status
Ute Ladies'-Tresses	*Spiranthes Diluvialis*	Rare

Source: State of Utah, Natural Resource, Division of Wildlife Resources, Plants.

Flood Plain

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) showed no designated flood zones within the corridor.

Wild and Scenic Rivers

According to the National Wild and Scenic Rivers System website, there are no wild and scenic rivers within the vicinity of the corridor.

Historic and Archeological Preservation
Due to the historic mining activities that took place there, Park City has historic structures and old mines such as the Silver King Mine. Typically, cultural resource assessments are performed once a project is identified. However, none are expected along the SR-248 corridor.

Fossil Preservation
No known fossil preservation is being conducted along the corridor.

Hazardous Waste Sites
No known hazardous waste sites have been identified along the corridor.

Visual Impacts
In the locations along SR-248 that might be widened or improved by UDOT, no long-term visual impacts due to construction, widening, or improvements are expected. However, landscaping and restoration of disturbed vegetation during construction will be needed.

Prime and Unique Farmlands
There are six Agricultural Protection Areas totaling approximately 139 acres along SR-248, just west of Kamas.

Section 4(f) Properties
The U.S. Department of Transportation's Section 4(f) law (49 USC 303) states that federal funds may not be approved for projects that use land from a significant publicly owned park, recreation area, wildlife or waterfowl refuge, or any significant historic site. Exceptions may be permitted if it is determined that there is no feasible and prudent alternative to the use of land from such properties and the action includes all possible planning to minimize harm to the property resulting from such use. The following list includes possible Section 4(f) designations:

Table 7 – Possible Section 4(f) Designations

Location	Milepost
Park City High School	0.9
McPolin Elementary School	1.16
Park City Learning Center	1.20
Treasure Mountain International School	1.39

2.1.D Utilities

The three segments of the corridor contain standard utilities common to an urban environment such as communication, natural gas, power, sewer, and water lines. In addition, a Park City

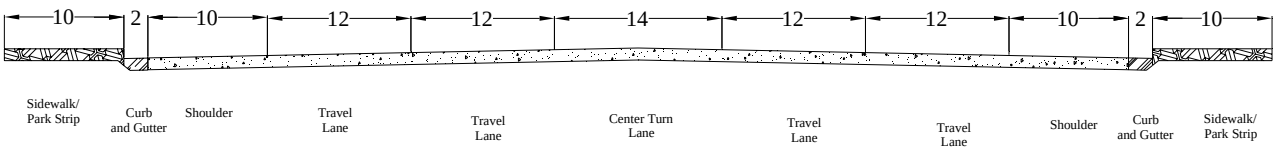
official indicated that the city intends to run a fiber optic cable along SR-248 from milepost 0.0 to milepost 2.0.

2.1.E Right-of-Way

In all Segments, most of the land adjacent to SR-248 is privately owned. The right-of-way varies from 100 to 140 feet in Segment 1, 140 to 400 feet in Segment 2, and 220 to 600 feet in Segment 3. Most of SR-248 is a two-lane facility. A constraint that might limit capacity improvements is overhead utility lines that run parallel to the corridor in Segment 1.

Table 8 – Right-of-Way Width	
Segment	Right-of-Way (ft)
1	100 -140
2	140 – 400
3	220 – 600

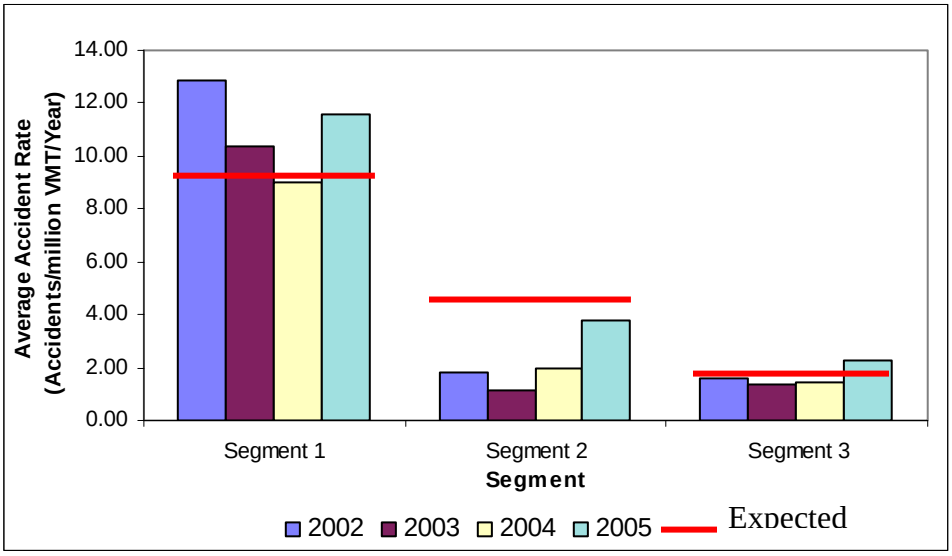
Figure 4 – State Standard Arterial Cross-Section (106 foot right-of-way)



2.1.F Safety

Figure 5 shows the average and expected accidents rates over a four year period. Expected accident values for each segment are also shown as provided by UDOT for the years 2002 to 2005. Both average and expected accident rates are reported in number of accidents per million Vehicle Miles Traveled (VMT) per year. For an urban road, expected accident rates depend on the functional class of the roadway, AADT, and the population within close proximity of the roadway. For these reasons, the expected accident rate varies from segment to segment. Segment 1 exceeds the accident rate, but not by much. The reason for a slightly higher accident rate is probably due to lots of pedestrian activity near the schools. Segment 2 is slight below the expected accident rate. However, accident rates can be expected to increase as the traffic volume increases in Segment 2. There are no surprised in Segment 3 where average and expected accident rates are nearly identical.

Figure 5 – Average and Expected Accident Rates



The accident rate for Segment 1 decreased every year except for an increase in 2005. Historic traffic trends have shown an increase in traffic volume in Segment 1 from 2002 to 2005. For Segment 2, the accident rate decreased from 2002 to 2003 but increased thereafter. Similarly, traffic volume in Segment 2 declined from 2002 to 2003 but has increased since then. In Segment 3, the accident rate was nearly constant as was the growth in traffic volume.

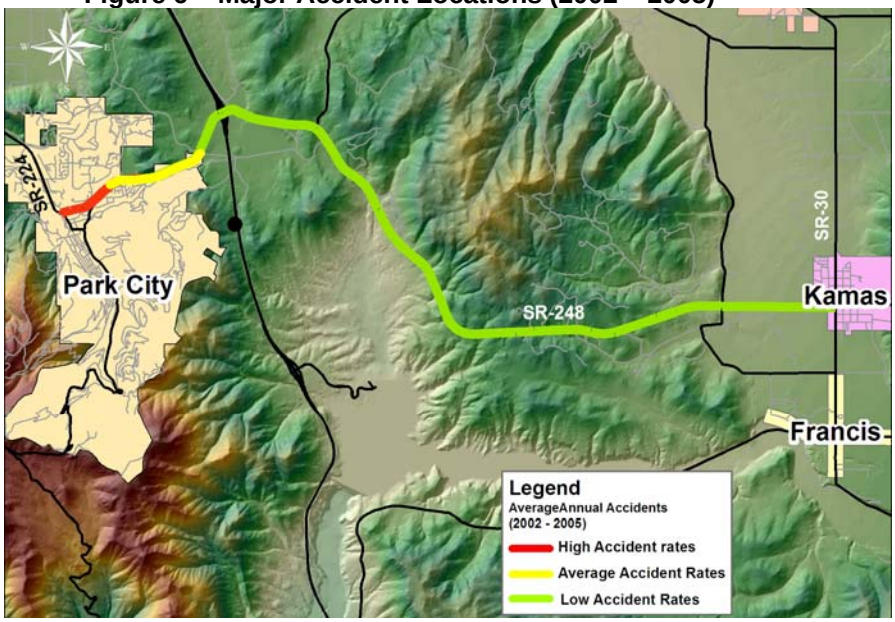
In Segment 1, more accidents occurred per VMT for three of the four years analyzed than expected for this type of facility and this neighborhood's population. However, exceeded rate was minimal. Segment 2, on the other hand, experienced fewer accidents than expected. The expected accident rate was just slightly exceeded by the actual observed rate in Segment 3 in 2002 and 2005. The values for the expected accident rates plotted in Figure 5 are listed in Table 9.

Table 9 – Expected Accident Rates						
Milepost	AADT (Weighted Average)				Functional Class	Expected Accident Rate (Accidents per million VMT per year)
	2002	2003	2004	2005		
Segment 1	16,235	16,363	18,472	18,838	Urban-Principal Arterial	9.01
Segment 2 West of US-40	11,294	10,030	10,835	11,233	Urban-Principal Arterial (west of US-40) and Rural-Minor Arterial (east of US-40	4.56
Segment 3	4,585	4,425	5,000	5,319	Rural-Minor Arterial	1.70

Source: UDOT Traffic & Safety Division

Analysis of accident data has shown that 50 percent of the total accidents in this corridor occurred at the intersections. Approximately 70 percent of the accidents at intersections were right angle collisions between left turning traffic and opposing through traffic. The remaining 30 percent included rear end and T-bone collisions. Of the non-intersection accidents, head-on collisions and accidents involving vehicle roadway departure crashes were equal in occurrence. Two fatalities were reported, one in 2003 in Segment 1, and the other in 2004 in Segment 3. Other accidents resulted in different types of injuries or, possibly, no injuries.

Figure 6 – Major Accident Locations (2002 – 2005)



2.1.G Geometric Design

Roadway

The roadway geometrics (travel lanes, lane widths, center turn lanes, intersection additional turn lanes, channelized right turns, paved shoulders, curb and gutter, and sidewalk) along the corridor are inventoried in Table 10. Each of these features affects capacity and safety of the corridor in various ways. For example, turn lanes are necessary to reduce the conflict between the slow speed turning traffic and the high speed through traffic.

Table 10 – Roadway Geometrics

Feature	Segment 1	Segment 2	Segment 3
Number of Travel Lanes	4	2	4 (mp 4.65 – 8.22) 2 (mp 8.22 – 14.5)
Lane Widths (feet)	12	12	12
Center Turn Lanes	100%	80%	5%
Intersection Additional Turn Lanes	Yes/No	Yes	Yes
Channelized Right Turns	Yes	No	Yes
Paved Shoulders	Yes	Yes	Yes
Curb, Gutter	100%	30%	2%
Sidewalk	100%	30%	2%

Intersections

No major intersection was identified as having geometric design deficiencies along this route.

2.1.H Structures

Two structures have been identified along this corridor:

1 US-40 overpass at milepost 3.14

2 Pedestrian underpass at Old Landfill Road

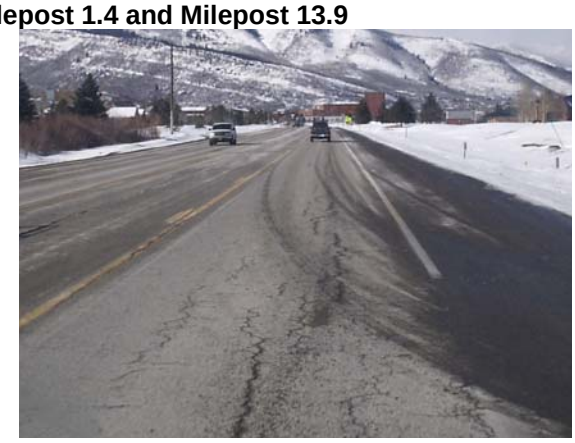
3 A bridge over an irrigation canal at milepost 14.19

However, a UDOT structures inventory has not been sent to InterPlan.

2.1.I Maintenance

One of the maintenance issues identified along SR-248 is cracking at different locations along the corridor. The greatest concentration of cracking is located in Park City and Kamas. Refreshing the striping and slope flattening in the clear zone are also needed at different locations. However, a recent asphalt overlay and re-striping has resolved the cracking and striping concerns.

Figure 7 – Cracking at Milepost 1.4 and Milepost 13.9



2.1.J Pavement Condition

A 10-year preservation program from 2011 to 2020 is shown in Table 11.

Table 11 – System Preservation Plan (2011–2020)

Milepost	Element ID	Year	Treatment	Cost
0.0 – 0.793	248P-00000	2015	Major Asphalt Rehabilitation	$1,172,542
0.0 – 0.793	0248P-000.00	2015	Safety Improvement	$326,193
0.793 – 3.125	248P-00079	2012	Minor Asphalt Rehabilitation	$1,128,144
0.793 – 3.125	248P-00079	2020	Minor Asphalt Rehabilitation	$1,429,100
3.125 – 14.5	248P-00312	2017	Functional Repair	$5,731,853
3.125 – 14.5	0C 751	2017	Repair Deck	$100,488

Source: UDOT System Preservation Plan 2011-2020

Drainage
No drainage issues were observed.

Striping and Signing
Lane striping has faded in some areas, particularly in Segment 3, and could be refreshed. Some signs for curves and speed limits have been removed. However, school crossing zones are well maintained in this corridor.

2.1.K Alternative Modes and Efficient Intermodal Transfer

Evaluating alternative modes of transportation is important to a functional and efficient transportation system. By reviewing modes beyond traditional highway usage as potential solutions, UDOT can move forward in providing a best-practice transportation system.

- Pedestrian – Pedestrian activity is more prevalent within Park City for Segment 1 and part of Segment 2. Sidewalks have been installed for all of Segment 1. Park City staff has indicated that coordination between them and UDOT regarding the development of

sidewalk should occur. Park City High School, McPolin Elementary, Park City Learning Center, and the Treasure Mountain International School are all located in Segment 1, which creates pedestrian and vehicle traffic. Park City staff has indicated that a pedestrian/bicycle crossing needs to be improved at the eastern end of SR-248 near the schools and that a crossing needs to be installed between Park Avenue and Bonanza Drive.

- Bicycle – Bike lanes have been striped in Segment 1. The other two segments do not have exclusive bike lanes, but there are shoulders. Park City staff has indicated that residents have asked for bike lanes on SR-248 from SR-224 to US-40. UDOT may want to consider striping shoulders to indicate bike lanes because this corridor is experiences heavy bike use.

- Transit – Bus numbers one and five of Park City's transit system run on a small portion of SR-248 from SR-224 to Comstock, a distance of approximately one mile.

Planning and coordination should also continue to take place in other systems of transportation including air and truck transportation, pipelines, and railroads. UDOT plays an important coordination role with each of these, particularly in ensuring efficient intermodal transfer with the highway system.

- Aviation – There are no aviation services along SR-248.

- Truck – Most of the truck traffic is generated by the various establishments along the corridor. Trucks use SR-248 to connect between Park City and Kamas. As mentioned earlier, truck traffic varied from 15 percent near the intersection of SR-224 in Park City to 39 percent near the intersection of SR-32 in Kamas.

- Pipeline – There are no signs of any existing pipeline**.**

- Railroad – There are no highway-rail grade crossings**.**

2.1.L Access Management Strategies

UDOT adopted Administrative Rule R930-6 to accommodate utilities and to control and protect state highway rights-of-way. The state highway access standards contain nine different categories. SR-248 has two access management categories in the study area. They are shown in Figure 8. However, UDOT has cooperative corridor preservation agreements on SR-248 with Park City, Summit County, and Wasatch County for nearly the entire corridor. This forward

thinking arrangement of preservation agreements between UDOT, Park City, Summit County, and Wasatch County will prove beneficial in preserving capacity along the corridor. The Park City and Summit County agreement identifies locations of existing and future traffic signals. Table 12 lists the current and future traffic signal locations in the agreement.

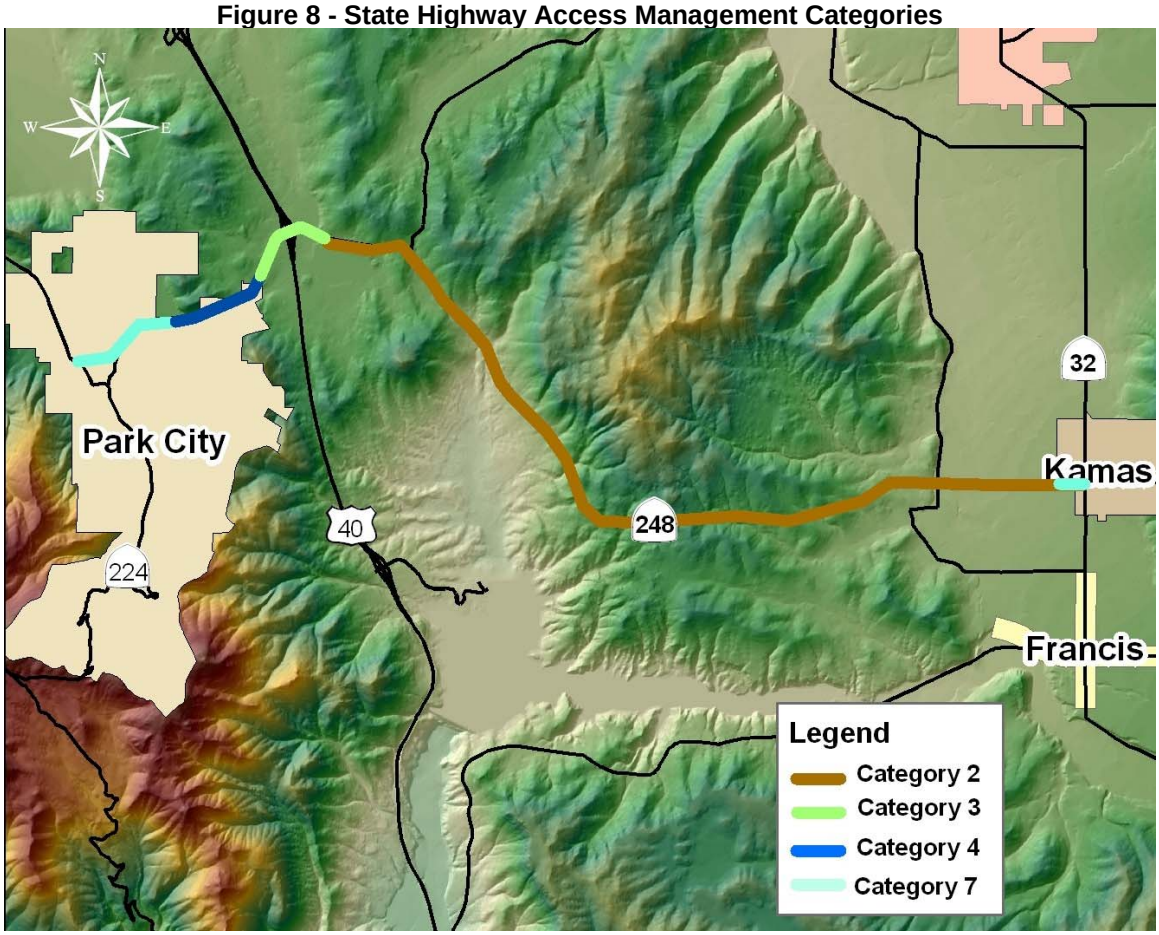
Table 12 – UDOT, Park City, and Summit County Corridor Preservation Agreement	
Location	Existing or Proposed
Homestake Road	Proposed
Bonanza Drive	Existing
Park City High School (Approximately midway between Bonanza and Comstock)	Proposed Pedestrian Signal
Comstock Drive	Existing
SR-248 at Old Dump Road	Proposed
SR-248 IHC Signal (minimum ¼ mile west of US-40 SB off-ramp terminal)	Proposed

Table 13 lists the future traffic signal locations on SR-248 in Wasatch County.

Table 13 – UDOT and Wasatch County Corridor Preservation Agreement
Brown's Canyon (Station 112+54)
Deer Mountain's Access (Station 185+25)
Tuhaye's Access (Station 348+17)

There are current access points along the corridor that do not meet the access management standards. Access management deficiencies are detailed in Section 5.2.A (Corridor Wide Recommendations) of this document. Table 14 shows the underlying standards where the cooperative corridor preservation agreements are not specific.

Figure 8 - State Highway Access Management Categories



Source: UDOT Administrative Rule R930-6, May, 2006

Table 14 – State Highway Access Management Standards

Category		Minimum Signal Spacing (feet)	Minimum Street Spacing (feet)	Minimum Access Spacing (feet)	Minimum Interchange to Crossroad Access Spacing (feet)		
					To 1st R-in R-out	To 1st Intersection	From last R-in R-out
2	System Priority Rural	5,280	1,000	1,000	1,320	1,320	1,320
3	System Priority Urban	2,640	No Un-Signalized Access Permitted		1,320	1,320	1,320
4	Regional Rural	2,640	660	500	660	1,320	500
7	Community Rural	1,320	300	150	Not Applicable		

Source: Administrative Rule R930-6, UDOT, 2003

2.1.M Relevant Studies

Traffic Signals and Traffic Control Devices

A recent study performed by InterPlan for Park City showed that the SR-248/Bonanza Drive intersection currently operates at an acceptable level of service in the p.m. peak period. Approximately 15 percent of the total number of accidents occurred at unsignalized intersections. Table 15 shows the current signalized intersections along the three Segments.

Table 15 – Signalized Intersections

Segment 1		Segment 2		Segment 3	
Intersection	Milepost	Intersection	Milepost	Intersection	Milepost
SR-224	0.0	SR-248/US-40	3.79	SR-32	14.5
Bonanza Drive	0.48	SR-248/US-40	4.24		
Comstock	1.11				

3 FUTURE CONDITIONS FORECAST

In this section, future conditions for land use, population, travel demand, and mobility needs will be discussed to show potential growth and its impacts on road conditions.

3.1 Analysis Area

The analysis area is from milepost 0.0 at the intersection of SR-224 in Park City and ends at the intersection of SR-32 in Kamas at approximately milepost 14.5

3.1.A Land Use Plans and Population Growth

Future land use along this corridor includes residential, commercial and schools. Park City and County officials indicated that the following developments will take place along SR-248 in the next ten years:

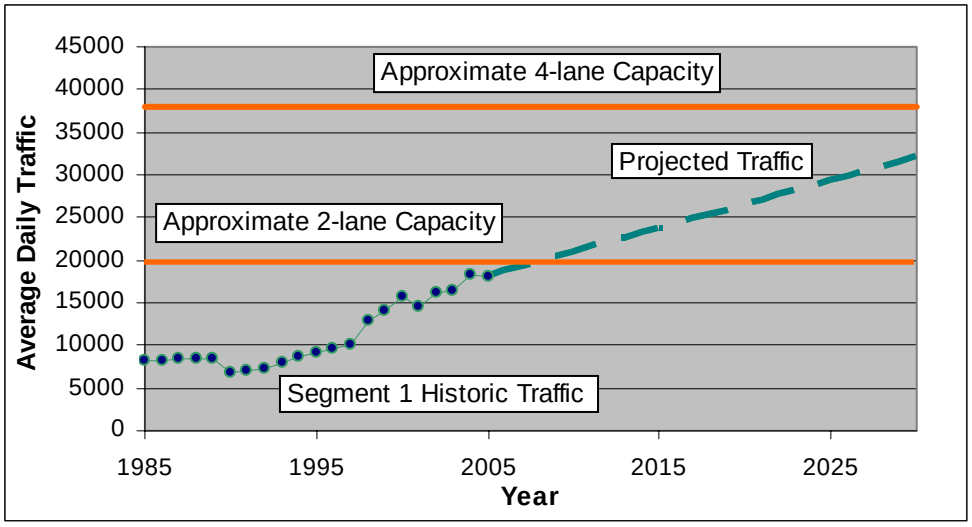
- A hospital and a US Ski Association recreational facility, including a 725 stall parking lot, are planned at approximately milepost 1.3.
- Additional residential development is planned in Segment 1.
- A major commercial development is anticipated to the north of SR-248 at approximately milepost 2.2.
- A recreational facility with a park and ride lot is planned at approximate mile post 3.00 at Gun Club Road.

3.1.B Travel Demand Growth

Future traffic growth on SR-248 is assumed to follow a linear trend as shown in Figures 9 and 10. SR-248 begins as a four-lane highway and decreases to a two-lane highway in the middle of Segment 1. The capacity for a four-lane highway is estimated to be 38,000 vehicles per day. However, Segment 1 is also a two-lane highway. Capacity for the two-lane highway is estimated to be at 20,000 vehicles per day as shown in Figure 9. Volume is approaching capacity for the two-lane portion of Segment 1. Volume for the four-lane portion of Segment 1 is estimated to not to exceed capacity over the next 20 years. Except for a passing lane, Segment 2 is mostly a two-lane highway. Part of Segment 3 is a four-lane highway, and the rest is a two-lane highway. For analysis purposes, the capacity for Segments 2 and 3 have been assumed to have a capacity of 20,000 vehicles per day, which is the capacity of a two-lane highway. Figure 10 shows that the capacity in Segment 2 will be at capacity in the 20 year horizon. However, UDOT has plans to widen Segment 2 to a four-lane highway. Therefore, Segment 2 should not reach capacity,

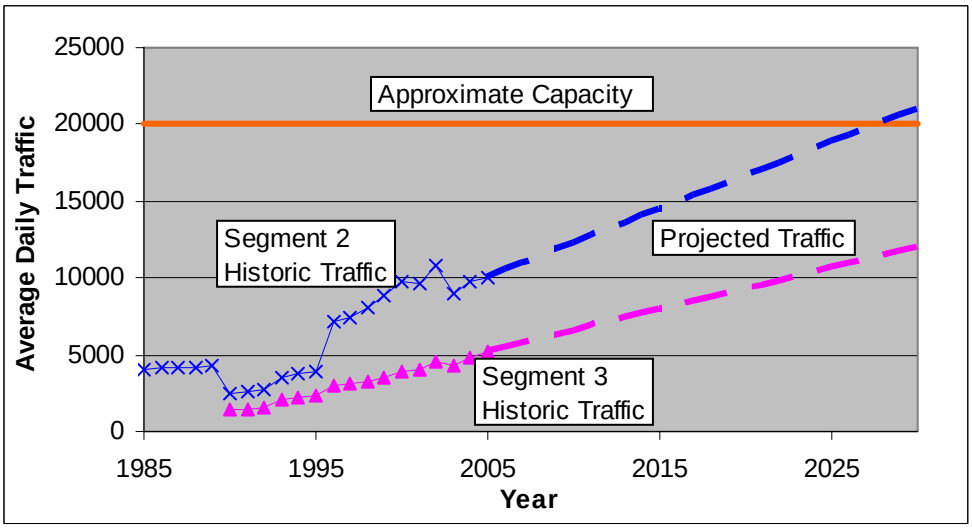
provided that the construction of the four-lanes is completed as planned. Segment 3's capacity will not be exceeded by the year 2030. Table 16 shows the projected traffic volumes for the three Segments.

Figure 9 – Traffic Forecast for Segment 1



Source: Traffic on Utah Highways; InterPlan

Figure 10 – Traffic Forecasts for Segments 2 and 3



Source: Traffic on Utah Highways; InterPlan

Table 16 – Projected Traffic Volumes			
Year	Segment 1	Segment 2	Segment 3
2005	18,118	10,083	5,213
2015	24,700	14,500	8,000
2030	32,000	21,000	12,000

3.1.C Present and Future Mobility Needs

The present and future mobility needs of the corridor are largely related to pedestrian traffic in Segment 1 and automobile traffic in all Segments. A discussion could be held between UDOT and the various cities along the corridor to establish the different strategic plans each of them has.

4 PUBLIC INVOLVEMENT

The SR-248 Corridor Study begins in Park City at SR-224, travels through Summit County and Wasatch County, and ends in Kamas at SR-32. These four jurisdictions were involved in the study through participating in a corridor drive. No public open house was held.

4.1 History of Public Involvement

The corridor drive took place on February 2, 2007. Representatives from Park City, Summit County, Wasatch County, UDOT Region Two, and UDOT Planning participated. During the drive, several comments were made about coordination between UDOT and the jurisdictions and about future maintenance projects. This meeting provided a formal opportunity for communication to occur between the professional city staffs and UDOT Maintenance staff. A representative from UDOT Planning Department was also present. Each jurisdiction provided comments about SR-248.

4.2 Outreach Methods and Tools Used

The corridor drive provided a formal opportunity for communication to occur between the professional jurisdictional staffs and UDOT Maintenance and Planning staffs.

4.3 Groups Involved and Summary of Contacts Made

Professional staffs were involved from Park City, Summit County, Wasatch County, Kamas, UDOT Region Two, and UDOT Planning.

4.4 Summary of Public Concern

Most of the comments centered on the following issues:

- Pedestrian safety along SR-248 in Park City.
- Congestion on SR-248 in Park City.
- Bicycle and pedestrian crossing on SR-248 near the schools and between Park Avenue and Bonanza.
- Access management in Wasatch County in Segment 3.
- Access management standards being too restrictive in Kamas in Segment 3.

5 CORRIDOR-WIDE RECOMMENDATIONS

UDOT has four strategic goals upon which their transportation work is centered. The four strategic goals are listed below.

- Take Care of What We Have
- Make the System Work Better
- Improve Safety
- Increase Capacity

The deficiencies that are identified in this report are listed under the four goals.

5.1 Take Care of What We Have

5.1.A Maintenance and Operations Deficiencies

Maintenance and operations deficiencies that have been identified include the following:

1. Cracks in the roadway in Park City and Kamas could be sealed.
2. Slope flattening in the clear zone is needed.
3. Refreshing the striping is needed at various locations along the corridor.

5.1.B Right-of-way

The current right-of-way varies between 100 and 600 feet for the length of the corridor. The only area where additional right-of-way may be needed is in Segment 1 where the corridor is 100 feet.

5.2 Make the System Work Better

5.2.A Access Management

Access management deficiencies that have been identified include:

1 The intersection spacing is shorter than the minimum 150 feet (either between two driveways or from an intersection) at the following locations in Segment 1: mileposts 0.05, 0.12, 0.16, 1.26 and 1.3.

2 The spacing between 100 West at milepost 14.37 and SR-32 is less than the 1,000 foot minimum.

Note: Access management standards were adopted after deficiencies such as driveways were built.

5.2.B Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) refers to transportation systems which apply emerging hard and soft information system technologies to address and alleviate transportation congestion problems. ITS can be subdivided into three categories: Advanced Traveler Information Systems (ATIS), Advanced Traffic Management Systems (ATMS), and Advanced Vehicle Control Systems (AVCS). The ITS strategies that can help SR-248 function more efficiently include updating signal timing plans and coordinating signalized intersections.

5.3 Improve Safety

5.3.A Reduce Crash Rates

The rate of accident occurrence on this corridor may be reduced by:

1. Accommodate bikes consistently with UDOT policies and plans.
2. Improving intersection operation by ensuring proper striping, signing, and signal timing.
3. Performing signal warrant analysis at pre-agreed upon unsignalized intersections.
4. Constructing sidewalks in Segment 1 from milepost 0.61 to milepost 1.36.

5.3.B Turn Lanes

Center and right turn lanes improve safety by reducing conflicts between motorists at intersections. However, turn lanes increase conflicts between motorists and bicyclists where bike lanes exist. Turn lanes have been provided at most of the intersections. At some major driveways, turn lanes are not striped, but wide shoulders or a center turn lane are available that can be utilized by turning vehicles.

5.3.C Bike Lanes

Bike lanes have been striped in Segment 1. The other two segments do not have exclusive bike lanes, but shoulders are present.

5.4 Increase Capacity

5.4.A Travel Demand Management

Travel Demand Management (TDM) is the planning and implementation of programs that seek to reduce road space demand by influencing travel choices and the amount and timing of travel. TDM aims to encourage more walking, cycling, public transit use, car-pooling, and tele-commuting. The following strategies can help reduce demand for space on SR-248:

1. Accommodate bikes consistently with UDOT policies and plans.

2. Install safe sidewalks in Segment 1 from milepost 0.61 to milepost 1.36 and in Segment 3 from milepost 11.5 to milepost 14.5 by working with Park City to determine best approach to partnering.

5.4.B Additional Highway Capacity

Table 17 lists UDOT's planned improvement project along SR-248. UDOT plans to widen the SR-248 from the end of the existing four lanes in Park City to US-40. Wetlands issues and other environmental considerations may increase costs above the estimated total below.

Table 17 – Planned Major Improvement Project

Location	Year	Length (Miles)	Improvement Type	Cost
Existing 4-lanes to US-40	2016 - 2025	8.22	Widen to 6-lane	$44,000,000

Source: UDOT Long Range Transportation Plan 2007-2030

6 LIST OF RECOMMENDED PROJECTS AND COST ESTIMATES

The objective of this study was to identify existing deficiencies and future corridor operational, capacity, and geometric characteristics that will become needs in the future. Another objective was to develop a list of improvement projects that will enhance the performance of the corridor. After analyzing the existing conditions and future requirements on SR-248, the recommended improvements are presented in Table 18. This list also includes existing projects contained in the system preservation plan.

Table 18 – Recommended Improvement Projects

Project	Begin MP	End MP	Year	Cost Estimate
Segment 1				
1. Install safety improvements^ • Install warning signs • Stripe lanes and shoulders	0.0	0.68	2008	$90,000
2. Install sidewalks^	0.61	1.36	2008	$1,000,000
3. Major asphalt rehabilitation*	0.793	1.36	2012	$274,295
4. Safety improvement*	0.0	0.793	2015	$326,193
5. Major asphalt rehabilitation*	0.0	0.793	2015	$1,172,542
6. Major asphalt rehabilitation*	0.793	1.36	2020	$347,469
Segment 2				
1. Install safety improvements^ • Stripe lanes and shoulders • Install better slope flattening in clear zone • Install warning signs	1.36	3.0	2008	$524,000
2. Major asphalt rehabilitation*	0.793	1.36	2012	$853,848
3. Functional repair*	3.125	4.65	2017	$768,446
4. Major asphalt rehabilitation*	0.793	1.36	2020	$1,081,630
Segment 3				
1. Functional repair*	4.65	14.5	2017	$4,963,406
2. Repair deck*	4.65	14.5	2017	$100,488

**UDOT System Preservation Plan 2011-2020*

^InterPlan's Estimates Using UDOT's Statewide Standard Item Average Prices, 2006 (See Appendix)

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8 APPENDIX

Appendix 8A – Annual Average Daily Traffic (AADT)						
	Segment 1		Segment 2		Segment 3	
	(mp 0.0-mp 1.36)		(mp 1.36-mp 4.65)		(mp 4.65-mp 14.5)	
Year	AADT	Forecast	AADT	Forecast	AADT	Forecast
1985	8125		4075			
1986	8250		4125			
1987	8375		4175			
1988	8390		4185			
1989	8495		4240			
1990	6760		2520		1435	
1991	6950		2593		1475	
1992	7265		2713		1545	
1993	7990		3545		2100	
1994	8615		3822		2265	
1995	9090		3867		2295	
1996	9610		7157		3000	
1997	9990		7440		3120	
1998	12820		8030		3235	
1999	14102		8832		3558	
2000	15690		9819		3960	
2001	14434		9663		4075	
2002	16235		10868		4585	
2003	16363		9003		4358	
2004	18180		9727		4855	
2005	18118		10083		5213	
2006		19073		11280		5804
2007		20029		12476		6396
2008		20984		13673		6987
2009		21939		14870		7579
2010		22894		16066		8170
2011		23850		17263		8762
2012		24805		18460		9353
2013		25760		19656		9945
2014		26716		20853		10536
2015		27671		22050		11128
2016		28626		23246		11719
2017		29581		24443		12311
2018		30537		25640		12902
2019		31492		26837		13494
2020		32447		28033		14085
2021		33402		29230		14677
2022		34358		30427		15268
2023		35313		31623		15860
2024		36268		32820		16451
2025		37224		34017		17043
2026		38179		35213		17634
2027		39134		36410		18226
2028		40089		37607		18817
2029		41045		38803		19409
2030		42000		40000		20000

Appendix 8B – Accident Data Analysis for SR-248							
Segment		2002			2003		
Beg MP	End MP	# of Accidents	AADT	Acc. Rate	# of Accidents	AADT	Acc. Rate
0.0	1.07	94	16,235	14.83	82	16,365	12.83
1.07	1.36	10	16,235	5.82	2	16,360	1.15
Weighted Average Values (Segment 1, mp 0.0 - mp 1.36)			**16,235**	**12.9**		**16,363**	**10.34**
1.36	3.13	8	12,255	1.01	7	12,350	0.88
3.13	4.53	13	10,175	2.5	5	7,330	1.33
4.53	4.65	3	10,175	6.73	1	7,330	3.11
Weighted Average Values (Segment 2, mp 1.36 – mp 4.65)			**11,294**	**1.85**		**10,030**	**1.15**
4.65	9.58	15	4,585	1.82	14	4,625	1.68
9.58	12.04	3	4,585	0.73	3	4,625	0.72
12.04	14.5	8	4,585	1.94	5	3,825	1.46
Weighted Average Values (Segment 3, mp 4.65 – mp 14.5)			**4,585**	**1.58**		**4,425**	**1.39**

Appendix 8C – Accident Data Analysis for SR-248							
Segment		2004			2005		
Beg MP	End MP	# of Accidents	AADT	Acc. Rate	# of Accidents	AADT	Acc. Rate
0.0	1.07	78	18,690	10.69	101	19,375	13.35
1.07	1.36	5	17,670	2.67	9	16,860	5.04
Weighted Average Values (Segment 1, mp 0.0 - mp 1.36)			**18,472**	**8.98**		**18,838**	**11.58**
1.36	3.13	13	13,340	1.51	39	13,830	4.36
3.13	4.53	7	7,920	1.73	12	8,210	2.86
4.53	4.65	4	7,920	11.53	2	8,210	5.56
Weighted Average Values (Segment 2, mp 1.36 – mp 4.65)			**10,835**	**1.97**		**11,233**	**3.77**
4.65	9.58	15	5,435	1.53	26	5,635	2.56
9.58	12.04	10	4,995	2.23	7	5,180	1.51
12.04	14.5	2	4,135	0.54	11	4,825	2.54
Weighted Average Values (Segment 3, mp 4.65 – mp 14.5)			**5,000**	**1.46**		**5,319**	**2.29**

Appendix 8D – Cost Estimates for SR-248 Safety Improvement					
ITEM	COST	UNIT	QUANTITY PER LINEAR FOOT		COST PER LINEAR FOOT OF ROADWAY
Concrete Sidewalk (5' wide)	$3.80	Ft^2	5*2*1	10.0	$ 38.00
Sidewalk Untreated Base Course - 1" Max (3"thick)	$0.89	Ft^3	5*(3/12)*2*1	2.5	$ 2.23
Curb and Gutter	$36.40	Ft	2*1	2.0	$ 72.80
Pavement Marking Paint	$2.45	Ft	5*1	5.0	$ 12.25
				Subtotal	$ 125.28
Mobilization and Temporary Traffic Control	calculated @ 15% of subtotal				$ 18.79
Contingency	calculated @ 20% of subtotal				$ 25.06
				Subtotal	$ 169.12
Engineering, construction, management, drainage & utilities	calculated @ 40% of subtotal				$ 67.65
Contingency for Price Increases	calculated @ 10% of subtotal				$ 16.91
TOTAL COST PER LINEAR FOOT					**$ 253.68**
COST OF CONSTRUCTING SIDEWALKS FROM MILEPOST 0.61 TO MILEPOST 1.36					**$ 1,004,580.23**

ITEM	COST	UNIT	QUANTITY PER LINEAR FOOT		COST PER LINEAR FOOT OF ROADWAY
Pavement Marking Paint	$2.45	Ft	5*1	5.0	$ 12.25
Slope Flattening	$0.36	Ft^3	12*4*1	48.0	$ 17.28
				Subtotal	$ 29.53
Signs (New)	calculated @ 1.5% of subtotal				$ 0.44
Mobilization and Temporary Traffic Control	calculated @ 15% of subtotal				$ 4.43
Contingency	calculated @ 20% of subtotal				$ 5.91
				Subtotal	$ 40.31
Engineering, construction, management, drainage & utilities	calculated @ 40% of subtotal				$ 16.12
Contingency for Price Increases	calculated @ 10% of subtotal				$ 4.03
TOTAL COST PER LINEAR FOOT					$ 60.46
TOTAL COST OF SAFETY IMPROVEMENT FROM MILEPOST 1.36 TO MILEPOST 3.0					**$ 523,558.40**

ITEM	COST	UNIT	QUANTITY PER LINEAR FOOT		COST PER LINEAR FOOT OF ROADWAY
Pavement Marking Paint	$2.45	Ft	5*1	5.0	$ 12.25
					$ 12.25
Signs (New)	calculated @ 1.5% of subtotal				$ 0.18
Mobilization and Temporary Traffic Control	calculated @ 15% of subtotal				$ 1.84
Contingency	calculated @ 20% of subtotal				$ 2.45
	Subtotal				$ 16.72
Engineering, construction, management, drainage & utilities	calculated @ 40% of subtotal				$ 6.69
Contingency for Price Increases	calculated @ 10% of subtotal				$ 1.67
TOTAL COST PER LINEAR FOOT					$ 25.08
TOTAL COST OF SAFETY IMPROVEMENT FROM MILEPOST 0.0 TO MILEPOST 0.68					**$ 90,053.96**